

REMARKS

Reconsideration of the merits of the application is respectfully requested in light of the Amendments to the Claims and the Remarks that follow.

Claims 51, 53, 54, and 56 were cancelled herein; after entry of this amendment, claims 45, 49, 50, 52, 55, and 57 are pending.

Applicant respectfully requests that this response be considered even though it is being submitted after final because it does not raise new issues and places the application in condition for allowance.

Election/Restrictions

The Final Office Action asserts that newly submitted claims 51, 53, 54, and 56 are directed to an invention that is independent or distinct from the invention originally claimed because curing and cured compositions are final products of intermediate/final product distinctness, since the intermediates can be used to make other than the claimed final products, such as teat dips.

Although Applicant does not necessarily agree with this, Applicant has cancelled claims 51, 53, 54, and 56.

§ 112 Rejection of the Claims

Claims 52, 55, and 57 stand rejected under 35 U.S.C. § 112, first paragraph, because the specification, while being enabling for water soluble compositions, does not reasonably provide enablement for the claimed articles and methods.

The Office Action stated that “a water soluble polyurethane composition would have too short a life to provide the claimed antimicrobial effects, when in the presence of water, such as rain on a roof shingle . . . the polymer must not be in a water soluble form as claimed, if it is at all useful as an antimicrobial applied on articles.”

The specification, as filed refers to water soluble coatings that can be cured and those that are not. Specifically, it is seen at page 18, lines 14-21 that there are multiple exemplified uses of water soluble antimicrobial polyurethanes as recited in the claims; for example, preservation of

cosmetics, topical antiseptics, hard surface antiseptics, and disinfection of articles such as contact lenses. Furthermore, example 12, at page 44, line 20 to page 46, line 9 exemplifies a specific water soluble antimicrobial polyurethane composition, and demonstrates that it is indeed antimicrobial. It would be well within the level of one of skill in the art to utilize a water soluble composition, such as that exemplified by Example 12, and utilize it in an article to afford antimicrobial activity to the article. Specific examples of the article include, but are not limited to those provided in the specification, such as preservation of cosmetics, topical antiseptics, hard surface antiseptics, and disinfection of articles such as contact lenses

Based on the comments offered above, Applicant respectfully requests that the rejection of claims 52, 55 and 57 under 35 U.S.C. § 112, first paragraph, be withdrawn.

§ 103 Rejection of the Claims

Claims 45, 49, 50, 52, 55, and 57 remain rejected under 35 U.S.C. § 103 as allegedly being obvious over U.S. Patent No. 4,451,635 ("Gould"), in view of U.S. Patent No. 3,931,319 ("Green") and U.S. Patent No. 4,110,286 ("Vandergaer"). Applicant respectfully traverses the rejection.

Applicant has previously asserted that it does not appear that Gould teaches an antimicrobial quaternary ammonium group. The Final Office Action stated that "absent some showing by Applicant that the quats of Green and Gould are not antimicrobials, examiner believes the instant claimed antimicrobial quaternary ammonium group is in fact present in Green and Gould" (Final Office Action, page 3). Applicant offers the following further explanation regarding the compounds of Green.

Gould claims that a quaternary ammonium polyurethane is synthesized, but Applicant disagrees. Green forms a polyurethane from polyols, aliphatic isocyanates, and a lactone which has -OH and -COOH groups on the chain (Gould, column 1, lines 15-25). Note that there is not an amine within the polyurethane that is formed. It is necessary to have an amine to form a quaternary ammonium group. The only way that an amine could be formed from the product of Gould is through hydrolysis of the urethane groups, i.e. degradation of the polymer just formed. Such degradation would defeat the purpose of Gould. It is well known that there can be no motivation to modify a reference if the modification would render the reference unusable for its intended purpose or change the principle of its operation (MPEP § 2143.01(V) and 2143.01(VI).

It is possible, that a base could cause degradation of the polyurethane formed in Gould. Gould does not disclose the addition of a base in the specification, however, some of the examples do. Such degradation could lead to a terminal amine being produced. In the Examples, Gould uses Desmodure W as the isocyanate (this is a methylene bis(cyclohexylisocyanate). Hydrolysis of the reaction product of Desmodure W could result in a terminal cyclohexyl amine. This cyclohexyl amine could then be reacted (as in the examples) with either chlorobutane or chlorobenzene. The only way a quaternary ammonium group could be formed in this way is by reacting one equivalent of this amine with 3 (or more) equivalents of chlorobutane or chlorobenzene groups. Quaternization is difficult to achieve due to steric hindrance, and the conditions used in Gould would probably not allow quaternization to occur. It is most likely that Gould has formed secondary and tertiary amines that become protonated by HCl liberated in the reaction. Therefore, Gould does not disclose or suggest the production of a polyurethane polymer with at least one antimicrobial quaternary ammonium group; because even if there were motivation to break down the polyurethane that is formed in Gould, such a reaction would not create the quaternary ammonium group that is recited in claim 45.

Even if Gould were successful in forming the quaternary ammonium salt, it would not be antimicrobial. Gould teaches the use of C₂-C₁₀ organic chloride reactants to quaternize (Gould, column 4, lines 7-13). Gould utilizes a single organic chloride. This is made clear at column 4, line 7, where it is stated that "The organic chloride...". This language is clearly singular, i.e. a single organic chloride. There is no reference to mixtures of organic chlorides or mixtures of chain lengths. Furthermore, all of the examples utilize a single organic chloride. Because Gould utilizes only a single organic chloride, only a quaternary ammonium salt which is a tri(organic chloride residue) moiety can be obtained. For example a triphenylammonium or tributylammonium group is what would be formed in all the examples. Such compounds do not have antimicrobial activity. This (either triphenylammonium or tributylammonium) species is the only species that can be formed. Only if Gould were to form something like a diethyloctylammonium group would one expect any antimicrobial activity. Even if ethylchloride and octylchloride were combined in a 2:1 ratio, or if the ethyl was reacted first and then the octyl were reacted, would Gould produce a mixture of ammonium group combinations.

Based on the arguments above, Applicant respectfully submits that Gould fails to disclose or suggest a polyurethane polymer with at least one antimicrobial quaternary ammonium group.

Green and Vandegaer fail to remedy this shortcoming of Gould. Therefore, the combination of Gould, Green, and Vandegaer fail to disclose or suggest all of the elements of at least claim 45.

Applicant also respectfully asserts that the combination of Green with Gould is improper because Green does not even teach a polyurethane. Green is entirely directed to reaction products of tertiary amines and dihaloalkenes. Thus, the combination of Green and Gould is improper since Green does not disclose that its teaching is relevant to polyurethanes. Furthermore, the reaction of Gould must be between a primary amine and an organic chloride whereas that of Green is to a tertiary amine combined with an organic halide. Thus, even if one were motivated to combine Green with Gould, which Applicant does not concede, and use the organic halide of Green in the Gould composition one would end up with a tri(organic halide residue) quaternary amine which, as discussed above, would not be antimicrobial.

With respect to Vandegaer, Applicant also submits that its combination with Gould and Green is improper because the polymers of Vandegaer are not water soluble as indicated by the multiple references throughout the patent that they are emulsified into water. (e.g. Abstract, Col. 1 lines 34-50, Col. 2 lines 4 and 22, Col. 8 lines 10-11, Col. 10 lines 40-68 etc.) By definition an emulsion is a mixture of one immiscible liquid in another. Therefore, one of skill in the art would not have been motivated to combine it with Gould and Green.

Based on the comments above, Applicant respectfully submits that Gould, Green, and Vandegaer do not render claims 45, 49, 50, 52, 55 and 57 obvious. Applicant therefore respectfully requests that this rejection be withdrawn.

Applicant also notes that there may be other arguments which were not presented herein, and Applicant does not concede those arguments by not having presented them herein. Applicant also does not necessarily agree with the correctness of statements made in the Office Action that were not rebutted herein.

In view of the foregoing amendments, Applicants respectfully request reconsideration and allowance of the claims as all rejections have been overcome. Early notice of allowability is kindly requested. Should the Examiner feel a telephone interview would be helpful in advancing this case to allowance, Applicant invites the Examiner to contact their representative at the number provided below.

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Respectfully submitted,

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